

## Claims

- [c1] 1. An information processing system and method for planning, design, and implementation of Web-based data integration, distributed query processing, and distributed transactions management, comprising:
  - (a) A software solution that includes an XML-based middleware for developing Web-based distributed applications.
  - (b) A programming model that defines the underlining architecture.
  - (c) A Graphical User Interface (GUI)-based tool kit that supports installation, customization, and administration of the Web-based applications under this architecture.
- [c2] 2. The information processing system and method of Claim 1 wherein said software solution consists of an XML-based standard for data sharing and the corresponding in-memory data structure.
- [c3] 3. The software solution of Claim 2 wherein said XML-based standard serves as the global schema for the distributed environment and the transfer syntax for data exchange among the participating sub-systems in this environment.
- [c4] 4. The software solution of Claim 2 wherein said XML-based standard defines the transfer syntax for marshaling the objects of in-memory data structure over the Internet.
- [c5] 5. The software solution of Claim 2 wherein said in-memory data structure is a relational data representation for local manipulation in disconnected mode. Under this construct, the participating sub-system may share data in the way that they have agreed upon.
- [c6] 6. The software solution of Claim 2 wherein said in-memory data structure is a class and objects as its instance may be taken by web services as arguments and may be returned by web services.
- [c7] 7. The software solution of Claim 2 wherein said XML-base standard and corresponding in-memory data structure are equivalent. That is, the data elements in the XML message that follows the standard, and those reside in the in-memory data structure may be seamlessly converted back and forth. This

equivalency has laid the basis for the method of our invention.

- [c8]        8. The method of Claim 1 wherein said software solution provides a systematical way in which distributed query processing and distributed transaction management may be carried out.
  
- [c9]        9. The method of Claim 1 wherein said middleware is composed of the in-memory data structure and an interface to the data sources. It is the interface that synchronizes the data structure and its data sources, so that the discrepancy between heterogeneous data sources can be cancelled.
  
- [c10]      10. The method of Claim 1 is implemented in data-consolidation server products by using various technology, including Microsoft .NET Framework and J2EE standard.